

Clinical pharmacists' perspective of medication adherence support in Ethiopian hospital settings: a qualitative study

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Abstract

Background Hospital pharmacists can assist patients with medication adherence in a hospital setting. No studies have explored the views of hospital pharmacists on medication adherence.

Objectives The study aimed to explore Ethiopian clinical pharmacists' understanding of and experience with medication adherence, and identify strategies for medication adherence support.

Methods Semi-structured interviews were conducted via ZOOM/Skype. Hospital pharmacists were recruited through a professional network and snowball sampling. All interviews were audio recorded, transcribed verbatim, translated into English and analysed using thematic analysis techniques. The data coding followed a hybrid deductive and inductive approach.

Key findings Fourteen Ethiopian clinical pharmacists participated in the study. Analysis yielded five main themes including: medication adherence definition and measurement; pharmacists' perceived roles; enablers of medication adherence; barriers to medication adherence; and ways forward. Participants indicated that accurately assessing medication adherence was complicated because of an absence of cost-effective and validated tools. Pharmacist education, clinical pharmacy services, physical structure, sources of medication information, and government initiatives to reduce financial burdens were the facilitators identified. Eight barriers were identified, and these were broadly classified as factors intrinsic or extrinsic to the patient.

Conclusions Medication adherence support could face barriers intrinsic or extrinsic to patients. Strategies were proposed to overcome the identified barriers and to harness existing facilitators. These strategies included the need for validated local language medication adherence tools, instituting regular adherence measurement and prioritizing patients for available interventions. Patient's preferred dosage form should be considered along with medication complexity and medication knowledge when supporting medication adherence.

Keywords: quality use of medicine; medication adherence; medication use; barriers; facilitators; pharmacists

Introduction

Medication adherence enhances effective illness management [1, 2] and is associated with reducing morbidity, hospitalizations, disability, avoidable early death, and ballooning healthcare costs [1, 3]. Yet, almost one in two patients in high-income countries (HICs), and even higher proportions in low- and middle-income countries (LMICs) do not take their medications as prescribed [1, 2]. According to the World Health Organization (WHO), adherence is defined as 'extent to which a person's behaviour—taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider' [2, p. 3].

Increasing the involvement of pharmacists to complement that of doctors has been recommended to boost medication adherence [4]. However, so far, studies have mostly examined doctors' [5] views on and patients' experiences [6–11] of medication adherence, with very little exploration of pharmacists' views. In hospital settings, pharmacists have more opportunity to collaborate with other healthcare

providers and interact with patients. With their enhanced involvement in direct patient care, hospital pharmacists' views should be explored to inform medication adherence support.

In Ethiopia, hospital pharmacists have been providing clinical pharmacy services in public hospitals since 2013 [12–14]. There are 367 public hospitals in Ethiopia within a three-tier healthcare system with primary, secondary, and tertiary levels [15, 16]. Full-capacity clinical pharmacy services are mostly provided in tertiary hospitals with clinical pharmacy teaching programs [12, 14]. These services are integrated in inpatient (ward-based), outpatient and emergency departments of public hospitals [15]. Most patients with chronic conditions attend hospital outpatient clinics for their ongoing care. This enables Ethiopian hospital pharmacists to be involved with chronic patient care not just acute care. The involvement of hospital pharmacists in intervention programs has been shown to improve medication adherence in Ethiopia [17].

This paper aims to explore Ethiopian clinical pharmacists' understanding of and experience with medication adherence, and identify strategies for medication adherence support.

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Methods

A qualitative descriptive study [18] was conducted to explore hospital pharmacists' views on medication adherence and strategies for medication adherence support that could inform the development of a medication adherence risk assessment tool, as a part of PhD research project.

A draft interview guide incorporating open-ended questions was developed based on a review of existing literature (Supplementary material 1). The guide was pre-tested with an Ethiopian clinical academic hospital pharmacist (who did not participate in the full study). Interviews were conducted in Amharic or English, according to the preference of the participant.

The interviews were audio recorded, transcribed verbatim (by HT, a male Ethiopian clinical academic hospital pharmacist and postgraduate student), and the Amharic versions translated into English (by HT). Participants were offered a copy of their Amharic and/or English transcripts to check the accuracy of the translation. Notes were taken during the interview.

A snowballing sampling technique was used to recruit clinical pharmacists. HT made initial contact via email through his professional network with pharmacists at the six teaching hospitals actively providing clinical pharmacy services in 2019, and the contacted pharmacists were encouraged to pass study details onto colleagues. Semi-structured interviews were conducted via ZOOM/Skype. Participant recruitment continued until the point when no new relevant information emerged from two successive interviews (data saturation). Data saturation can often be reached within the first 12 interviews, depending on the complexity of the study (group heterogeneity, data quality, and domain of interest) [19]. Participants were informed that HT was studying for a Doctor of Philosophy (PhD).

All authors iteratively read the English transcripts. This enabled identification of any emerging areas of interest, which were included as additional prompts for subsequent interviews, and determination of when data saturation was reached. The final data were analysed in Microsoft Word using a hybrid deductive and inductive approach [20]. Broad, concept-driven deductive codes were initially developed based on the study's research questions, which were subsequently applied to the transcripts. These broad preliminary codes were role of pharmacists, facilitators, barriers and ways forward [20, 21]. After iteratively reading the coded transcripts, one additional code (medication adherence definition and measurement) was added to refine the final set of deductive codes. The final deductive codes were assigned to excerpts of English transcripts for each participant. Excerpts with similar deductive codes were brought together for further analysis. Then, the data under each theme were inductively analysed to identify sub-themes, ensuring that all relevant information related to the research questions were captured, with no preconceptions [20, 21]. The coding was led by the lead author (HT). The second author (JS) read the coded data and discussed any discrepancies with HT. The final codes and themes identified were reviewed and cross-checked by other authors (SW and ETE). The identified themes, patterns, and relationships were used to build the results. This study was reported using the COnsolidated criteria for REporting Qualitative study(COREQ) checklist [22].

This study was approved by the Human Research Ethics Committee at the University of New England (Approval No. HE19-130). Written informed consent was obtained from all participants prior to commencing their interview. Confidentiality of participants was maintained by allocating them a unique code.

Results

Fourteen (12 male and 2 female) pharmacists from four different hospitals in Ethiopia participated in the study (Table 1). Eight of the 20 pharmacists initially contacted via email did not respond. Two interviews were conducted in English, and the remaining twelve in Amharic. Data saturation was reached with the 13th interview and an additional interview was undertaken to confirm this.

The age of participants ranged from 26 to 33 years (Table 1). The interviews ranged in length from 30 to 50 min. One participant asked to receive a copy of their transcript and did not report any errors. The interview data for the five main themes are described below, with representative quotes from participants.

Theme-1. Medication adherence definition and measurement

Taking medication as instructed/prescribed was the definition used for medication adherence by all participants. However, there was divergence in thinking around adherence. Some

Table 1. Demographics of study participants.

Characteristics	N = 14
Gender	
Male	12 (86%)
Female	2 (14%)
Mean age (range), year	29 (26–33)
Highest level of education	
BPharm	7 (50%)
MSc	7 (50%)
Hospitals	
University of Gondar Comprehensive Specialized Hospital, Amhara Region	10
Tikur Anbessa Specialized Hospital, Addis Ababa	2
Assela Referral and Teaching Hospital, Oromia region	1
Dessie Referral Hospital, Amhara region	1
Clinical pharmacist role	
Academics and clinical preceptors	7 (50%)
Ward-based pharmacist and dispenser	7 (50%)
Years of experience (range)	5.9 (3–10)

Ethiopia has a three-tier healthcare system comprising primary, secondary, and tertiary (specialized) level hospitals. Tertiary (specialized) hospitals are referral centres for secondary hospitals that provide a broad spectrum of advanced healthcare services, including surgery, for approximately 3.5–5 million people. The pharmacists who responded to this survey were all working in tertiary (specialized) hospitals located in urban areas.

participants described medication adherence as simply an ability to precisely follow the instructions of a healthcare professional in taking medication.

Anyway, medication adherence is when the patient takes his/her medication appropriately according to the instructions they are told to do so. (P11)

Whereas the majority perceived adherence as requiring agreement between the patient and prescriber.

...adherent to their medications if they take the medications as prescribed based on the shared decisions, and recommendations between patients and their health care providers. (P1)

It was noted that challenges in improving medication adherence start with its measurement. This was thought to be due partly to the absence of cost-effective and validated tools, the low use of combined tools and the lack of routine medication adherence measurement except for patients attending HIV and pulmonary TB clinics.

Routine assessment of medication adherence is not common in our area. Assessing adherence is much better in HIV patients taking ART [Antiretroviral therapy]. (P13)

In our health setting, there are no tools that have been translated into Amharic, and no tools are also validated. (P9)

Theme-2. Perceived roles of pharmacists in medication adherence

Based on pharmacists' interactions with patients while supporting medication adherence the pharmacists' roles described by participants were broadly classified as direct or indirect (Table 2).

Direct roles were those where pharmacists work directly with patients to support medication adherence including medication counselling, and identifying patients at high risk of non-adherence.

Table 2. Roles of pharmacists for medication adherence support.

Perceived roles of pharmacists
Direct role (working with patients)
<ul style="list-style-type: none"> • Provision of medication counselling • Identifying patients at risk for non-adherence • Provision of telemedicine • Monitoring of medication adherence • Planning and provision of interventions such as reminders
Indirect roles
<ul style="list-style-type: none"> • Collaborate with other healthcare providers (participate in multi-disciplinary round) • Consulting other health professionals through communication • Medication reconciliation • Participating in medication selection • Participate in policy making • Medication synchronization • Adverse drug reaction prevention and management • Recommending for simplification of complex medication regimen • Medication review (e.g. recommending dose adjustment) • Identify medication-related problems

Pharmacists are, therefore, in a pivotal position to identify patients who are prone to medication taking problems. (P1)

To get a better adherence outcome, I usually counsel the patient well while dispensing. (P5)

Indirect roles involve pharmacists' working in collaboration with doctors to conduct medication review and provide interventions, such as discussing medication selection or simplification of the medication regimen to support medication adherence.

Pharmacists could work cooperatively with other health professionals to [...]enhance medication adherence. (P12)

Theme-3. Facilitators to medication adherence

Participants were asked about the available facilitators that could be utilized to support medication adherence. Five sub-themes identified are pharmacist education, clinical pharmacy services, physical structure, source of medication information, and government initiatives to reduce the financial burden.

It was noted by participants that the new clinically oriented pharmacy curriculum equips pharmacists with clinical skills to improve medication adherence. The introduction of the 'National Clinical Pharmacy Service Implementation Manual in Ethiopia' [23] empowers pharmacists to directly interact with patients to support medication adherence.

This [the implementation manual] supports the active participation of pharmacists in direct patient care or empowers pharmacists to work with their patients to improve medication adherence. (P7)

A separate counselling room and having a Drug Information Centre (DIC) where patients access medication information either directly or via a pharmacist were also reported as facilitators of medication adherence. In Ethiopia, DICs are specialized units within hospitals that provide healthcare providers and patients with accurate, up-to-date and evidence-based medication information. The establishment of DICs in Ethiopian hospitals has been recognized as a key strategy to improve the quality of pharmaceutical care and medication safety [24].

DIC increases adherence by providing proper documents to patients and allowing free access for pharmacists to get updated information that may be shared with patients. (P14)

Government initiatives to reduce the financial burden associated with medication also assist medication adherence. These include medication subsidies, instigating health insurance, and providing free medical care for the poorest of the poor.

Theme-4. Barriers to medication adherence

Participants identified eight barriers that could influence medication adherence, and these factors were broadly classified as intrinsic (related to the patient) or extrinsic (external) to the patient.

Table 3. Identified barriers to medication adherence in Ethiopia.

1. Intrinsic factors	2. Extrinsic factors
<p>1.1 Socioeconomic and education background</p> <ul style="list-style-type: none"> • Special populations (elderly, children) • Economic difficulty (may not afford cost of medication and transportation to healthcare) • Social support (caregiver) • Low educational level (low literacy, ability to read, and remember instructions) <p>1.2 Patient's health belief</p> <ul style="list-style-type: none"> • Patient's perceived need for medication <ul style="list-style-type: none"> ○ When they feel well ○ When they feel worse ○ For long-term medication • Patient perceived effectiveness of medication <ul style="list-style-type: none"> ○ When no change occurs ○ Take time to respond • Perceived safety of medication <ul style="list-style-type: none"> ○ Worry of side effects <p>1.3 Patient's preferred dosage form</p> <ul style="list-style-type: none"> • Prefer to injection among acute/critically ill patients • Prefer to orally taken medication among chronic ambulatory patients <p>1.4 Medication knowledge</p> <ul style="list-style-type: none"> • Identifying medication with its colour or dosage form • Inadequate knowledge on <ul style="list-style-type: none"> ○ Purpose, dose, timing, side effect, what to do, what to do if miss a dose 	<p>2.1 Medication counselling</p> <p>2.1.1 <i>No counselling services due to</i></p> <ul style="list-style-type: none"> • No sufficient time to spend time with patients due to <ul style="list-style-type: none"> ○ Referral hospitals giving services to 5–6 million patients (high patient flow) ○ High staff workload (low healthcare provider-to-patient ratio) • No well-organized setup in few health setting • Less priority for medication counselling service • Telephoning a patient not in practice <p>2.1.2 <i>If any, inadequate medication counselling</i></p> <ul style="list-style-type: none"> • Absence of structured counselling checklist • Absence of written information delivery (only verbally) • Lack of comprehensive counselling <ul style="list-style-type: none"> ○ Pharmacists simply read the prescription and give medication to the patient • Authoritarian model of care than collaborative (engaging patients less in decision-making) <p>2.2 Patient care coordination</p> <ul style="list-style-type: none"> • Poor provider-patient relationship • The absence of well-organized and interconnected healthcare • Lack of a system for health professionals to collaborate • Pharmacists, doctors, nurses are not working together (conflict of interest) • Doctors not consulting pharmacists when changing a patient's medication <p>2.3 Medical condition and treatment</p> <p>2.3.1 <i>Disease condition</i></p> <ul style="list-style-type: none"> • Chronic disease, severity, comorbidity, psychiatric disorders and those with substance abuse <p>2.3.2 <i>Treatment</i></p> <ul style="list-style-type: none"> • Medication regimen complexity, polypharmacy, lifelong treatment, high frequent dosing, duration of treatment • Side effect • Delayed clinical response with some medication (e.g. antidepressant) <p>2.4 National medication supply</p> <ul style="list-style-type: none"> • The country's economy to achieve access to quality medicine • Weak supply chain management (poor logistic system, drug procurement system) • Few health insurance companies • <i>Resulting in</i> <ul style="list-style-type: none"> ○ Expensive medication cost (out of pocket) ○ Interrupted medication supply, unavailability ○ Shortage/stock out of medication in hospital

Four intrinsic barriers were identified, including patient's socioeconomic and educational background, health beliefs (perceived need, effectiveness, and safety of medication), patient's preferred dosage form, and medication knowledge (Table 3).

The sociodemographic and economic background barriers were age (older people, children), economic difficulty, inadequate social support, and low educational level.

About 30%–40% of the medication cost is out of pocket. For example, if a patient is living with both DM and

CVD, patients may not afford to buy medication for both diseases. (P6)

Health beliefs held by patients about the need, effectiveness or side effects of medication were identified by participants as influencing patients' decision to take medication.

The other thing is patients may consider that their condition is benign or easy. After they feel well, they may discontinue it while they should have taken it for a long period of time. (P3)

Medication can come in a variety of dosage forms (e.g. mixtures, tablets, injections) and patient's preference for specific dosage forms was identified as a barrier. Participants considered that most patients with chronic diseases would opt to take oral medication due to convenience, while patients with acute conditions preferred to have an injection, anticipating a rapid recovery.

Critically ill patients or patients with acute illness prefer an injection. If you give such patients orally taken medication, they will not be happy and may even dump it. (P8)

Patients' medication knowledge was reported as possibly impeding their ability to take medication as prescribed.

The other problem is inadequate knowledge about medication and illness.... Let's say patients on insulin are unable to self-administer insulin injection and store the insulin based on the recommendation because of this [inadequate knowledge]. (P6)

Four extrinsic barriers were identified including medication counselling, patient care coordination, medical conditions and their treatment, and national medical supply.

Poor medication counselling was reported to reduce medication adherence; reasons suggested for poor medication counselling included

- Lack of adequate time,
- Lack of separate/private room,
- Absence of counselling checklist,
- Low use of written information and
- An authoritarian rather than collaborative model of care.

The high workload associated with routine clinical care was reported as a factor that makes it difficult for health-care providers to have adequate time for detailed medication counselling and as the primary reason for poor or insufficient medication counselling.

Heaps of patients at once in the health facility make it challenging to provide for each patient's need. (P11)

Patient care coordination, including inter-professional collaboration, was identified as a challenge.

A system for health professionals to collaborate has not yet been established, they meet patients, but there are no trends to discuss patients with different professionals. (P14)

It was felt that patients with chronic illnesses (e.g. CVD, diabetes) are more prone to poor medication adherence as they require long-term treatment and often experiencing multimorbidity, leading to more complex therapy, side effects, frequent dosing, and additional instructions.

If a patient is taking more than 5 medications, there is different administration time for each medication, increased chance of side effect occurrence. So, the patient may feel frustrated even before taking them. (P5)

Poor patient access to medication due to the national medication policy was a barrier identified. Issues raised related to limited subsidy/free-drug programs, poor supply chain management and few health insurance options.

Theme-5. Ways forward/overcoming strategies

A number of options were suggested to improve support for medication adherence including empowering patients; improving medication counselling; simplifying medication regimens; leveraging the role of pharmacists; health system governance; and improving access to medication ([Supplementary material 2: Table S1](#)).

Patient empowerment was deemed instrumental in patients' decision-making and self-medication management. According to participants, strategies on how best to empower patients include granting autonomy to patients, developing therapeutic relationships during medication counselling and providing medication-related information to improve medication knowledge.

Patients should decide which medication and the appropriate means of administration works best for them. So, patients should be given the right to choose medication, considering their economic status. (P11)

Strategies reported by participating pharmacists to improve medication counselling, so that patients would obtain adequate information about their medications, included individualized counselling, improved quality of counselling, and ensuring privacy of patients.

The intervention should be individualized, be considerate of economic status and literacy level. (P6)

Strategies identified to improve the quality of counselling included identifying patients at higher risk for non-adherence to prioritize patients for intervention and save time in busy resource-constrained settings ([Supplementary material 2: Table S1](#), section 2.2).

Even though there is a high patient burden, pharmacists should try to give more time, especially for special populations like pregnant women or elderly people (P4)

Simplifying a complex medication regimen was suggested to support medication adherence, with recommendations including decreasing dosing frequency, using fixed-dose combined tablets, and de-prescribing inappropriate medications.

Ok, if patients need multiple medications, we can have a chance to minimize the pill burden. This can be done by selecting fixed combined medication or medication that can be a treatment for two or more diseases. (P5)

It was reported that pharmacists' roles in the provision of pharmaceutical care could be better utilized to support medication adherence through improving inter-professional collaboration, pharmacists' competency and clinical pharmacy services.

In my opinion, a pharmacist should work in a team with other professionals to ensure 100% adherence. [...] From my experience, patients who are receiving a team-based approach counselling are likely to be more adherent. (P4)

Macro-level recommendations were identified for health system governance, and improving access to medication ([Supplementary material 2: Table S1](#)).

Discussion

Participating hospital pharmacists perceived medication adherence as influenced by many factors, both intrinsic and extrinsic to patients. The intrinsic factors included socio-economic status, education, health belief, preferred dosage form, and medication knowledge. Medication counselling, patient care coordination, specific medical conditions, treatment regimen, pharmacist education, clinical pharmacy services, physical structure, source of medication information, government initiatives to reduce the financial burden, and national medication supply were identified as factors extrinsic to patients.

The strength of this study lies in interviewing clinical pharmacists about their experience with medication adherence, which has not been explored in the existing literature. Internationally there is a lack of evidence on pharmacists' perception of medication adherence, despite strong recommendations to involve pharmacists in interventions to enhance medication adherence. This study contributes valuable findings to address this gap not only in the Ethiopian context but also internationally. However, a limitation is that results may not be relevant to all locations. For example, rural health service settings may experience different factors than those identified in this study and government policy and practice frameworks in other countries may influence medication adherence differently. The use of snowball sampling in this study is another limitation, as it may have introduced bias by over-representing certain groups due to its reliance on professional networks [25]. While care was taken to facilitate accurate translation of transcripts from Amharic to English, back translation into Amharic was not performed and this is another potential limitation.

Participants indicated that routine measurement of medication adherence is seldom practised in Ethiopian hospitals. Moreover, accurately assessing medication adherence was complicated by the absence of validated self-report tools. Self-report tools are prone to social-desirability and overestimation, and hence they need to be validated in a particular context, for example, different diseases or languages [26]. All medication adherence measures have limitations and a combination of measures could minimize the pitfalls associated with a single measure [27].

Intrinsic factors including patients' age, education, medication knowledge, social support, financial status, and medication beliefs were all mentioned as potential barriers to medication adherence. Many of these factors have been previously reported as impacting medication adherence [5] or management of chronic disease [28]. However, patient's preferred dosage form has not been reported previously. Participants reported that the beliefs held by patients about dosage forms were dependent on their medical condition. Anticipating a rapid recovery, patients with acute illness prefer injections to

oral medication. Oral dosing is preferred amongst patients with long-term medication due to the inconvenience and difficulty of self-administration of injections at home. As an example, this could be problematic for patients with diabetes requiring insulin injections long-term, resulting in poor adherence [29].

Patients with chronic illness who need lifelong treatment are at risk of non-adherence. Chronic illness is often accompanied by comorbidities and polypharmacy, which in turn could result in medication regimen complexity [30, 31]. In this study, participating pharmacists reported that medication regimen complexity could negatively influence medication adherence, which is consistent with the findings of a systematic review [32]. The rate of adherence was found to decrease by 10% with a single addition to the daily dosing frequency [33] while reducing multiple daily dosing to once per day has been shown to improve adherence [34].

Factors extrinsic to patients such as poor medication counselling, high staff workload and poor inter-professional patient-care coordination were reported to negatively impact medication adherence. Doctors' lack of adequate time for medication counselling, poor patient-provider relationships, weak follow-up system, and poor inter-professional collaboration have also been reported as barriers to medication adherence by doctors [5]. Patient care coordination has been identified as a challenge when supporting self-medication management for chronic illness in HICs in both community pharmacy [35] and hospital pharmacy [28, 36] settings.

Patient empowerment and provision of adequate medication counselling were some of the strategies discussed by participants for overcoming the barriers to medication adherence. Patient empowerment has been linked with supporting medication adherence and better clinical outcomes [37]. The provision of adequate medication counselling or medication counselling that follows a patient-centred approach to build mutual trust and clinical relationship for shared decision-making have been reported as key for effective medication adherence support [38, 39]. In the current study, most participants indicated that healthcare providers currently offer authoritative care which engages patients less in the decision-making process, which aligns with previous findings that the authoritative care provided by doctors may discourage patients from participating in shared decision-making [5]. Healthcare providers shifting their role to focus on person-centred care was expected to improve medication adherence. Moreover, pharmacists can also play a role in fulfilling patients' expectations with effective communication, which has been associated with improved patient satisfaction and medication adherence [40].

Busy workflow and high patient burden limit healthcare professionals from providing medication counselling and other tailored interventions. To maximize the effectiveness of the available resources, participants suggested identifying patients at higher risk for non-adherence who could then be prioritized for available intervention programs. The medication adherence factors in this study could inform research to develop a medication adherence risk assessment tool to proactively provide extra support. This study also provides suggestions on improvements that could be integrated into tailored intervention programs, policies, and curricula to support medication adherence in daily clinical care and research projects.

Conclusion

When supporting medication adherence, healthcare providers should consider patient's preferred dosage form along with medication complexity and patient's medication knowledge. Medication adherence could be supported by empowering patients, prioritizing patients for available interventions, simplifying medication regimens, leveraging pharmacists' roles, enhancing health system governance, and improving access to medication. Understanding of medication adherence would be improved if there were validated medication adherence tools in the local language which would enable medication adherence to be routinely assessed.

Supplementary data

Supplementary data is available at *International Journal of Pharmacy Practice* online.

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Author contributions

H.G.T.: conceptualization, methodology, formal analysis, data curation, writing—original draft. S.W.: methodology, validation, writing—review and editing. E.T.d'E.: methodology, validation, writing—review and editing. M.J.S.: conceptualization, methodology, validation, writing—review and editing. All authors have read and approved the final manuscript.

Conflict of interest statement:

The author(s) declare no conflicts of interest.

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Data availability

Additional data are available upon reasonable request to the corresponding author.

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